

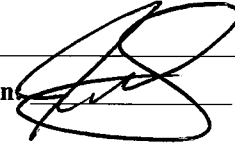
# Work Order ID 148783

Friday, July 08, 2016 8:14:12 AM

**\*148783\***

Page 1

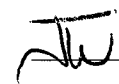
Item ID: D5445-042 Accept **\*N900040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
 Item Name: Cross Beam Assembly, RH  
 Start Date: 07/08/2016 Start Qty: 1.00 **\*1\*** Cust Item ID:  
 Required Date: 07/15/2016 Req'd Qty: 1.00 **\*1\*** Customer:  
 Reference:

Approvals: Process Plan  Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

| Draw Nbr | Revision Nbr |
|----------|--------------|
| D5445    | A            |

|                      |                     |      |  |  |  |  |  |  |  |
|----------------------|---------------------|------|--|--|--|--|--|--|--|
| 100                  |                     | 0.00 |  |  |  |  |  |  |  |
| <b>*100*</b>         |                     |      |  |  |  |  |  |  |  |
| CNC Bend I           | Memo                | 0.01 |  |  |  |  |  |  |  |
| CNC Delta 100 Bender | BEND/CUT AS PER DWG |      |  |  |  |  |  |  |  |

 16-07-11

|                 |                                               |      |  |  |  |  |  |  |  |
|-----------------|-----------------------------------------------|------|--|--|--|--|--|--|--|
| 110             | QC5- Inspect part completeness to step on W/O | 0.00 |  |  |  |  |  |  |  |
| <b>*110*</b>    |                                               |      |  |  |  |  |  |  |  |
| QC              | Memo                                          | 0.00 |  |  |  |  |  |  |  |
| Quality Control |                                               |      |  |  |  |  |  |  |  |

D 16-07-13

|                              |                       |      |  |  |  |  |  |  |  |
|------------------------------|-----------------------|------|--|--|--|--|--|--|--|
| 120                          |                       | 0.00 |  |  |  |  |  |  |  |
| <b>*120*</b>                 |                       |      |  |  |  |  |  |  |  |
| Mill Conv                    | Memo                  | 0.01 |  |  |  |  |  |  |  |
| Conventional Milling Machine | MILL/DRILL AS PER DWG |      |  |  |  |  |  |  |  |
|                              | DEBURR                |      |  |  |  |  |  |  |  |

1 0 DAS 32 9-89 16-07-11

**Work Order ID 148783**

Friday, July 08, 2016 8:14:12 AM

**\*148783\***

Page 2

Item ID: D5445-042 Accept **\*N900040100\*** Setup Start **\*NS1\***  
Revision ID: Stop **\*NS2\***  
Item Name: Cross Beam Assembly, RH  
Start Date: 07/08/2016 Start Qty: 1.00 **\*1\*** Cust Item ID:  
Required Date: 07/15/2016 Req'd Qty: 1.00 **\*1\*** Customer:  
Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description                | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|-----------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 130                            | QC2- Inspect parts off machine FAI/FAIB | 0.00                 |         |        |              |               |               |                  | DAS            |
| <b>*130*</b>                   |                                         |                      |         |        |              | 1             | Ø             |                  | 32             |
| QC                             | Memo                                    | 0.00                 |         |        |              |               |               |                  | 9-89           |
| Quality Control                |                                         |                      |         |        |              |               |               |                  | 16-07-11       |
| 140                            | QC8- Inspect parts - second check       | 0.00                 |         |        |              |               |               |                  | DAS            |
| <b>*140*</b>                   |                                         |                      |         |        |              | 1             | Ø             |                  | 44             |
| QC                             | Memo                                    | 0.00                 |         |        |              |               |               |                  | 9-89           |
| Quality Control                |                                         |                      |         |        |              |               |               |                  | 16-07-12       |
| 150                            | Chemical Conversion Coat per QSI005 4.1 | 0.00                 |         |        |              |               |               |                  |                |
| <b>*150*</b>                   |                                         |                      |         |        |              |               |               |                  |                |
| HandFinish                     | Memo                                    | 0.00                 |         |        |              |               |               |                  |                |
| Hand Finishing                 |                                         |                      |         |        |              |               |               |                  |                |

① 2016/07/12  
BEB.

**Work Order ID 148783****\*148783\***

Page 3

Friday, July 08, 2016 8:14:12 AM

Item ID: D5445-042 Accept **\*N900040100\*** Setup Start **\*NS1\***  
Revision ID: Stop **\*NS2\***  
Item Name: Cross Beam Assembly, RH  
Start Date: 07/08/2016 Start Qty: 1.00 **\*1\*** Cust Item ID:  
Required Date: 07/15/2016 Req'd Qty: 1.00 **\*1\*** Customer:  
Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description                      | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|-----------------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 160                            | QC7-Inspect Chemical Conversion Coat          | 0.00                 |         |        |              |               |               |                  |                |
| <b>*160*</b>                   |                                               |                      |         |        |              |               |               |                  |                |
| QC                             | Memo                                          | 0.00                 |         |        |              |               |               |                  |                |
| Quality Control                |                                               |                      |         |        |              |               |               |                  |                |
| 170                            |                                               | 0.00                 |         |        |              |               |               |                  |                |
| <b>*170*</b>                   |                                               |                      |         |        |              |               |               |                  |                |
| Small Fab                      | Memo                                          | 0.00                 |         |        |              |               |               |                  |                |
| Small Fab                      | INSTALL NUT PLATES AS PER DWG                 |                      |         |        |              |               |               |                  |                |
| 180                            | QC5- Inspect part completeness to step on W/O | 0.00                 |         |        |              |               |               |                  |                |
| <b>*180*</b>                   |                                               |                      |         |        |              |               |               |                  |                |
| QC                             | Memo                                          | 0.00                 |         |        |              |               |               |                  |                |
| Quality Control                |                                               |                      |         |        |              |               |               |                  |                |

① 16-07-13 PD

1 FF JUL 14 2016

① 16-07-14 DAS 9 9-89

# Work Order ID 148783

Friday, July 08, 2016 8:14:12 AM

**\*148783\***

Page 4

Item ID: D5445-042 Accept **\*N900040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
 Item Name: Cross Beam Assembly, RH  
 Start Date: 07/08/2016 Start Qty: 1.00 **\*1\*** Cust Item ID:  
 Required Date: 07/15/2016 Req'd Qty: 1.00 **\*1\*** Customer:  
 Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID | Operation<br>Description                                 | Set Up/<br>Run Hours | Tool ID | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp |
|--------------------------------|----------------------------------------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 190                            | <del>White Gloss (Ref 4.3.5.1) per QSI005 4.3 Alum</del> | 0.00                 |         |        |              |               |               |                  |                |
| <b>*190*</b>                   |                                                          |                      |         |        |              |               |               |                  |                |
| Powdercoat                     | Memo                                                     | 0.00                 |         |        |              |               |               |                  |                |
| Powder Coating                 | MASK NUT PLATE HOLES                                     |                      |         |        |              |               |               |                  |                |
| 200                            | <del>QC3 - Inspect Part Finish</del>                     | 0.00                 |         |        |              |               |               |                  |                |
| <b>*200*</b>                   |                                                          |                      |         |        |              |               |               |                  |                |
| QC                             | Memo                                                     | 0.01                 |         |        |              |               |               |                  |                |
| Quality Control                |                                                          |                      |         |        |              |               |               |                  |                |
| 210                            |                                                          | 0.00                 |         |        |              |               |               |                  |                |
| <b>*210*</b>                   |                                                          |                      |         |        |              |               |               |                  |                |
| Small Fab                      | Memo                                                     | 0.01                 |         |        |              |               |               |                  |                |
| Small Fab                      | <del>INSTALL END CAPS WITH SIKAFLEX AS PER NOTE 8</del>  |                      |         |        |              |               |               |                  |                |

*N/A 4/16.07.07*  
*SEE E-MAIL*  
*ATTACHED*  
*FLM*

# Work Order ID 148783

Friday, July 08, 2016 8:14:12 AM

**\*148783\***

Page 5

Item ID: D5445-042 Accept **\*N900040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
 Item Name: Cross Beam Assembly, RH  
 Start Date: 07/08/2016 Start Qty: 1.00 **\*1\*** Cust Item ID:  
 Required Date: 07/15/2016 Req'd Qty: 1.00 **\*1\*** Customer:  
 Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

| Sequence ID/<br>Work Center ID                | Operation<br>Description                                        | Set Up/<br>Run Hours | Tool ID    | Tool # | Plan<br>Code | Accept<br>Qty | Reject<br>Qty | Reject<br>Number | Insp.<br>Stamp    |
|-----------------------------------------------|-----------------------------------------------------------------|----------------------|------------|--------|--------------|---------------|---------------|------------------|-------------------|
| 220<br><b>*220*</b><br>QC<br>Quality Control  | QC5- Inspect part completeness to step on W/O<br><br>Memo       | 0.00<br><br>0.01     | <i>N/A</i> |        |              |               |               |                  |                   |
| 230<br><b>*230*</b><br>Packaging<br>Packaging | Identify as per dwg & Stock Location: <i>Prelim</i><br><br>Memo | 0.00<br><br>0.00     |            |        |              |               |               |                  | <i>DAS 9 9-89</i> |
| 240<br><b>*240*</b><br>QC<br>Quality Control  | QC21- Final Inspection - Work Order Release<br><br>Memo         | 0.00<br><br>0.01     |            |        |              |               |               |                  |                   |

*RD161016-01*

DAS  
21  
9-89

JUL 19 2016

# Picklist Print

Friday, July 08, 2016 8:14:11 AM

Page 1

Work Order ID: 148783

**\*148783\***

Parent Item: D5445-042

**\*D5445-042\***

Parent Item Name: Cross Beam Assembly, RH

Start Date: 07/08/2016

Required Date: 07/15/2016

Start Qty: 1.00

Required Qty: 1.00

## Comments:

| Component Item ID/<br>Item Name | Replacement<br>Item ID | Mfg/<br>Purch | Bin<br>Item | Primary<br>Location | Last<br>Location | Route<br>Seq ID | Unit of<br>Measure | Qty on<br>Hand | Qty per Kit | Total<br>Qty | Qty<br>Issued | Date<br>Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|

M6061T6TR1.5X1.0W1  
25

Purchased

No

f

12.0000

6

**\*M6061T6TR1 5X1 0W125\***

6061-T6 Rect Tube 1.5 x 1.0 x .125w McMaster p/n: 6546K999

Location

Loc Qty

Loc Code

MAT

12

m134971

12

D5445-043

Manufactured

No

Each

0.0000

2

~~**\*D5445-043\***~~

End Cap Assembly

CR2672-3-(03)

Purchased

No

Each

0.0000

12

DAS  
6  
9-89

**\*CR2672-3-(03)\***

Cherry Rivet

MS21059-4

Purchased

No

Each

0.0000

5

DAS  
6  
9-89

**\*MS21059-4\***

Nut Plate

MS21061L4

Purchased

No

Each

0.0000

1

DAS  
6  
9-89

**\*MS21061L 4\***

Nutplate

MS24694-S4

Purchased

No

Each

56.0000

4

~~**\*MS24694-S4\***~~

Screw

Location

Loc Qty

Loc Code

ST285

56

11788

56

DAS  
6  
9-89

JUL 13 2016

| ITEM | QTY | P/N               | DESCRIPTION             |
|------|-----|-------------------|-------------------------|
|      | X   | D5445-041         | CROSS BEAM ASSEMBLY, LH |
| 1    | 2   | D5445-043         | END CAP ASSEMBLY        |
| 2    | 1   | D5445-1           | CROSS BEAM, LH          |
| 3    | 12  | CR2672-3-(03)     | RIVET CHERRY, CSK       |
| 4    | 5   | MS21059-4         | NUT PLATE               |
| 5    | 1   | MS21061L4         | NUT PLATE               |
| 6    | 4   | MS24894-S4        | SCREW, CSK 100"         |
| 7    | A/R | SIKAFLEX-241/-291 | SEALANT                 |

**DETAIL A**

**DETAIL B**

**D5445-041 CROSS BEAM ASSEMBLY, LH**

**NOTES:**

- 1) MATERIAL: N/A
- 2) FINISH: POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
- 7) WEIGHT: 3.52 lbs
- 8) SEAL END CAPS WITH SIKAFLEX-241/-291
- 9) MASK NUT PLATE HOLES PRIOR TO POWDER COAT

**RELEASED**  
2016-06-29  
EN16-579

APPROVED

|            |             |                                                                                                                                                                                                                                                                          |              |
|------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| A          | NEW ISSUE   | RF                                                                                                                                                                                                                                                                       | 16.05.24     |
| REV.       | DESCRIPTION | BY                                                                                                                                                                                                                                                                       | DATE         |
| DESIGN     | RF          | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                 |              |
| DRAWN      | RF          |                                                                                                                                                                                                                                                                          |              |
| CHECKED    | VS          | DRAWING NO.                                                                                                                                                                                                                                                              | REV. A       |
| MFG. APPR. | JLM         | <b>D5445</b>                                                                                                                                                                                                                                                             | SHEET 1 OF 6 |
| APPROVED   | HS          | TITLE                                                                                                                                                                                                                                                                    | SCALE        |
| DE APPR.   | DS          | <b>CROSS BEAM ASSEMBLY</b>                                                                                                                                                                                                                                               | NTS          |
| DATE       | 16.05.24    | COPYRIGHT © 2016 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD. |              |

| ITEM | QTY | P/N               | DESCRIPTION             |
|------|-----|-------------------|-------------------------|
|      | X   | D5445-042         | CROSS BEAM ASSEMBLY, RH |
| 1    | 2   | D5445-043         | END CAP ASSEMBLY        |
| 2    | 1   | D5445-2           | CROSS BEAM, RH          |
| 3    | 12  | CR2672-3-(03)     | RIVET CHERRY, CSK       |
| 4    | 5   | MS21059-4         | NUT PLATE               |
| 5    | 1   | MS21061L4         | NUT PLATE               |
| 6    | 4   | MS24694-S4        | SCREW, CSK 100°         |
| 7    | A/R | SIKAFLEX-241/-291 | SEALANT                 |

**DETAIL D**

**DETAIL C**

**D5445-042 CROSS BEAM ASSEMBLY, RH**

**NOTES:**

- 1) MATERIAL: N/A
- 2) FINISH: POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
- 7) WEIGHT: 3.52 lbs
- 8) SEAL END CAPS WITH SIKAFLEX-241/-291
- 9) MASK NUT PLATE HOLES PRIOR TO POWDER COAT

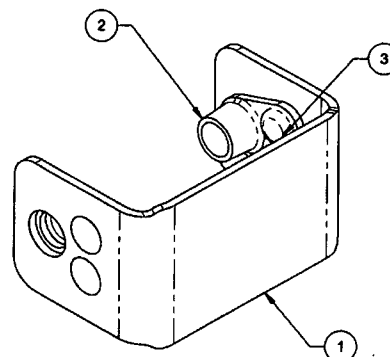
**RELEASED**  
2016-06-29

APPROVED

|                                                                                                                                                                                                  |          |                                        |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------|--------------|
| DESIGN                                                                                                                                                                                           | RF       | <b>DART AEROSPACE LTD</b>              |              |
| DRAWN                                                                                                                                                                                            | RF       | HAWKESBURY, ONTARIO, CANADA            |              |
| CHECKED                                                                                                                                                                                          | VS       | DRAWING NO.                            | REV. A       |
| MFG. APPR.                                                                                                                                                                                       | JLM      | <b>D5445</b>                           | SHEET 2 OF 6 |
| APPROVED                                                                                                                                                                                         | HS       | TITLE                                  | SCALE        |
| DE APPR.                                                                                                                                                                                         | DS       | <b>CROSS BEAM ASSEMBLY</b>             | NTS          |
| DATE                                                                                                                                                                                             | 16.05.24 | COPYRIGHT © 2016 BY DART AEROSPACE LTD |              |
| THIS DOCUMENT IS UNCLASSIFIED AND IS SUPPLIED ON THE CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD. |          |                                        |              |



| ITEM | QTY<br>-043 | P/N            | DESCRIPTION       |
|------|-------------|----------------|-------------------|
|      | X           | D5445-043      | END CAP ASSEMBLY  |
| 1    | 1           | D5445-3        | END CAP           |
| 2    | 2           | MS21086L08     | ANCHOR NUT        |
| 3    | 4           | MS20426AD3-(4) | RIVET, SOLID, CSK |



**D5445-043 END CAP ASSEMBLY**

**NOTES:**

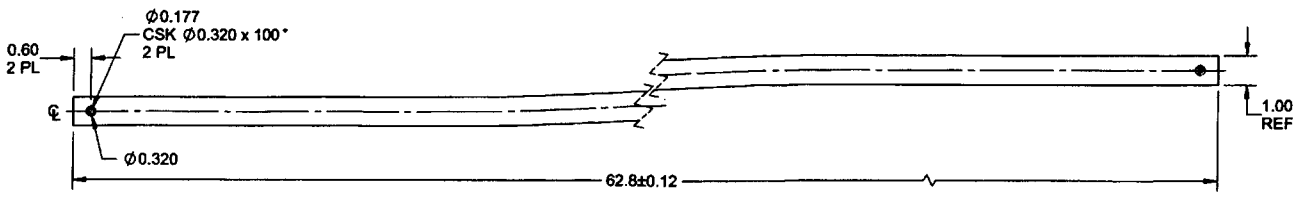
- 1) MATERIAL: N/A
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.7
- 7) WEIGHT: 0.01 lbs

**RELEASED**  
2016-06-29

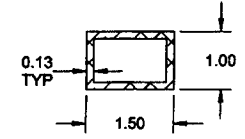
APPROVED

|            |          |                                                                                                                                                                                                                                                                                                   |              |
|------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | RF       | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                                         |              |
| DRAWN      | RF       | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                                                       |              |
| CHECKED    | VS       | DRAWING NO.                                                                                                                                                                                                                                                                                       | REV. A       |
| MFG. APPR. | JLM      | D5445                                                                                                                                                                                                                                                                                             | SHEET 3 OF 8 |
| APPROVED   | HS       | TITLE                                                                                                                                                                                                                                                                                             | SCALE        |
| DE APPR.   | DS       | <b>CROSS BEAM ASSEMBLY</b>                                                                                                                                                                                                                                                                        | NTS          |
| DATE       | 16.05.24 | <small>COPYRIGHT © 2016 BY DART AEROSPACE LTD<br/>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS RETURNED ON THE EMPLOYER'S REQUEST THAT IT IS<br/>NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT<br/>WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small> |              |

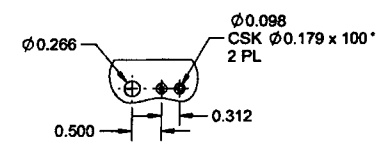
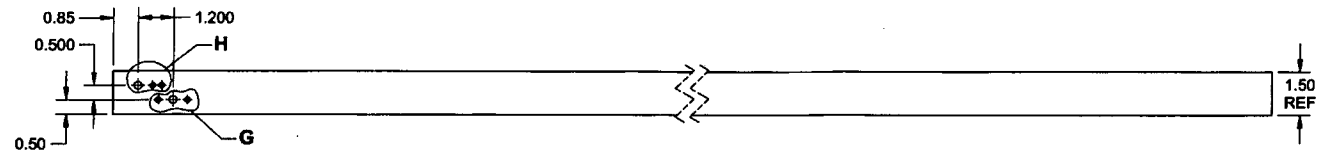
8 7 6 5 4 3 2 1



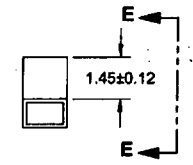
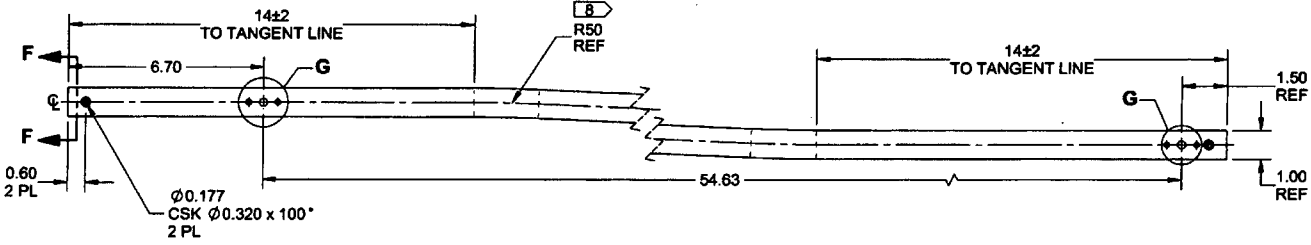
VIEW E-E



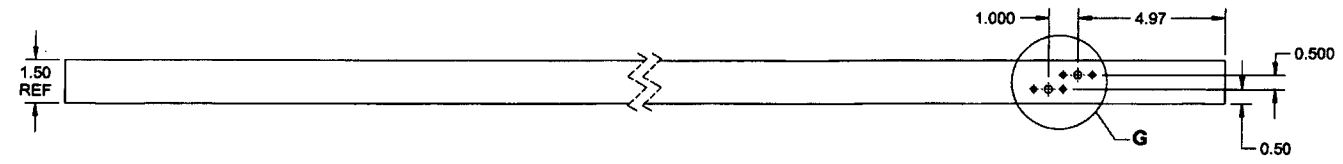
SECTION F-F



DETAIL H



DETAIL G



D5445-1 CROSS BEAM, LH

- NOTES:
- 1) MATERIAL: POSSIBLE VENDOR McMASTER CARR, P/N 6546K38, 6R IN LENGTH  
6061-T6 RECTANGULAR TUBE 1.5" x 1.0" x 0.125" WALL  
PER ASTM B221, YIELD STRENGTH: 35,000 psi
  - 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
  - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
  - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
  - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
  - 6) IDENTIFICATION: N/A
  - 7) WEIGHT: 3.44 lbs
  - 8) BEND RADIUS NOT CRITICAL

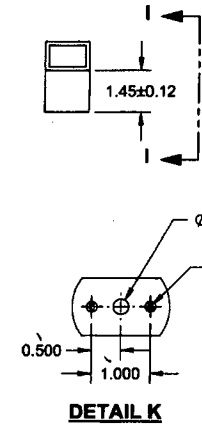
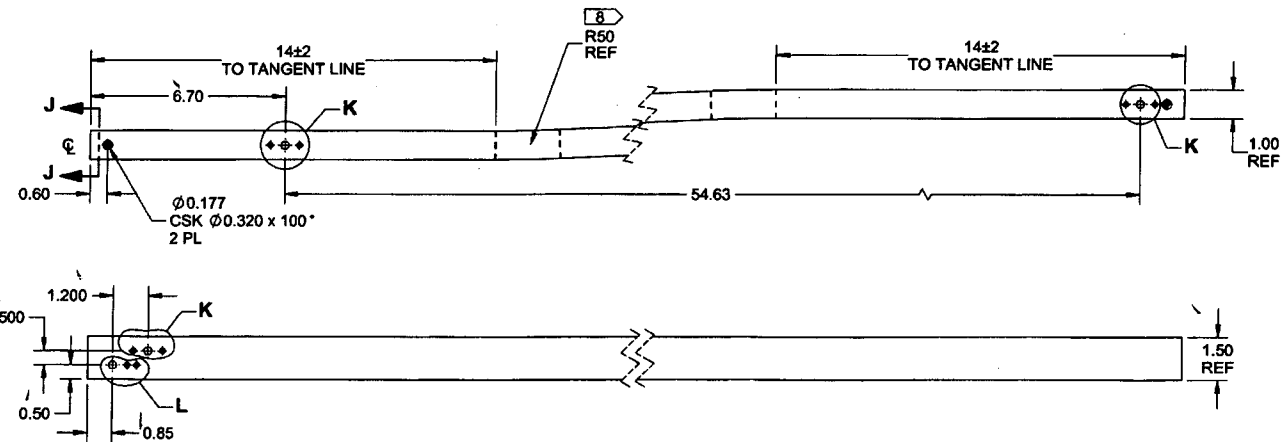
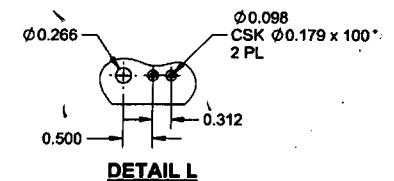
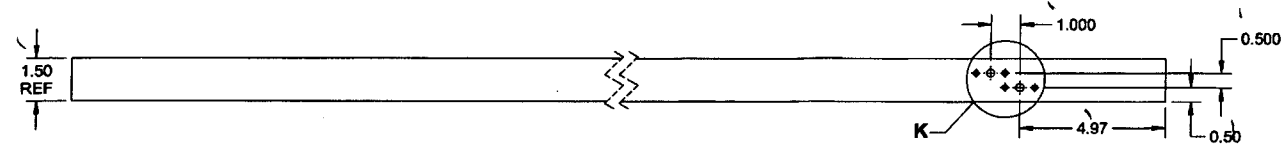
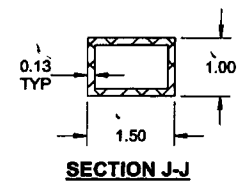
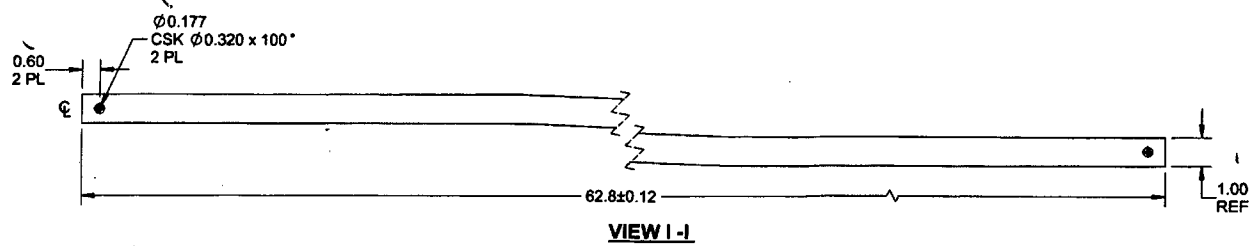
RELEASED  
2016-06-29

APPROVED

|            |          |                                                                                                                                                                                                                                                                               |              |
|------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | RF       | DART AEROSPACE LTD<br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                             |              |
| DRAWN      | RF       |                                                                                                                                                                                                                                                                               |              |
| CHECKED    | VS       | DRAWING NO.                                                                                                                                                                                                                                                                   | REV. A       |
| MFG. APPR. | JLM      | D5445                                                                                                                                                                                                                                                                         | SHEET 4 OF 8 |
| APPROVED   | HS       | TITLE                                                                                                                                                                                                                                                                         | SCALE        |
| DE APPR.   | DS       | CROSS BEAM ASSEMBLY                                                                                                                                                                                                                                                           | NTS          |
| DATE       | 16.05.24 | COPYRIGHT © 2018 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. USE IS LIMITED TO THE SPECIFIC CONDITION THAT IT IS<br>NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED TO ANY OTHER PERSON WITHOUT<br>WRITTEN PERMISSION FROM DART AEROSPACE LTD. |              |

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

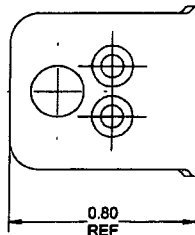
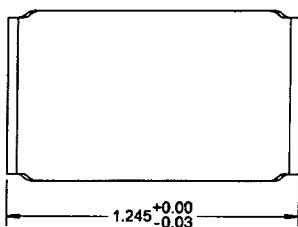
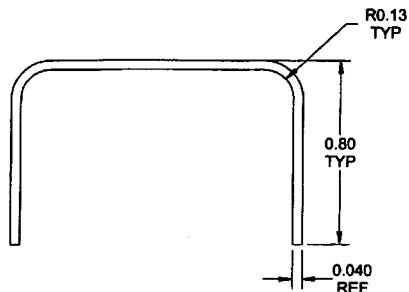


- NOTES:**
- 1) MATERIAL: POSSIBLE VENDOR McMASTER CARR, P/N 6546K38, 6R IN LENGTH  
6061-T6 RECTANGULAR TUBE 1.5" x 1.0" x 0.125" WALL  
PER ASTM B221, YIELD STRENGTH: 35,000 psi
  - 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
  - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
  - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
  - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
  - 6) IDENTIFICATION: N/A
  - 7) WEIGHT: 3.44 lbs
  - 8) BEND RADIUS NOT CRITICAL

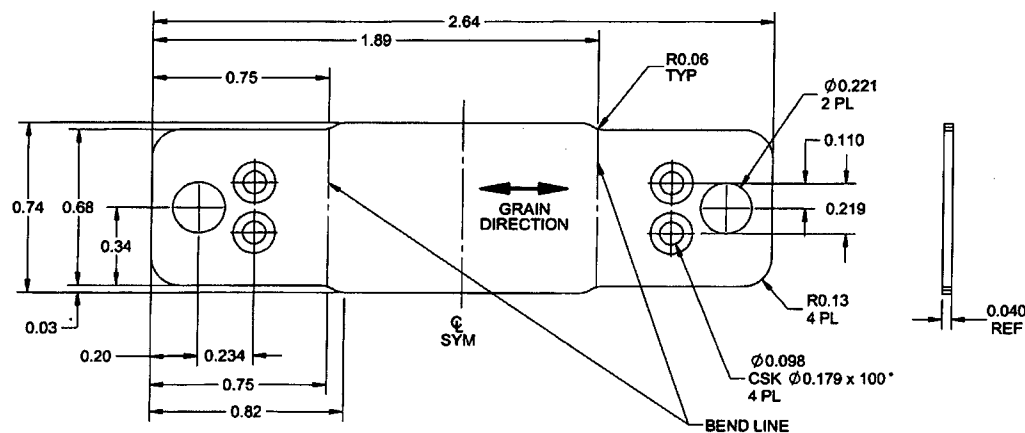
**RELEASED**  
2016-06-29

APPROVED

|            |          |                                                                                                                                                                                                                                                                               |              |
|------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | RF       | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                      |              |
| DRAWN      | RF       |                                                                                                                                                                                                                                                                               |              |
| CHECKED    | VS       | DRAWING NO.                                                                                                                                                                                                                                                                   | REV. A       |
| MFG. APPR. | JLM      | <b>D5445</b>                                                                                                                                                                                                                                                                  | SHEET 5 OF 8 |
| APPROVED   | HS       | TITLE                                                                                                                                                                                                                                                                         | SCALE        |
| DE APPR.   | DS       | <b>CROSS BEAM ASSEMBLY</b>                                                                                                                                                                                                                                                    | NTS          |
| DATE       | 16.05.24 | COPYRIGHT © 2018 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS<br>NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED TO ANY OTHER PERSON WITHOUT<br>WRITTEN PERMISSION FROM DART AEROSPACE LTD. |              |



**D5445-3 END CAP**  
(MAKE FROM D5445-3F)



**D5445-3F FLAT PATTERN**

**NOTES:**

- 1) MATERIAL: 6061-T6/T62 ALUMINUM SHEET, 0.040 THICK  
PER QQ-A-250/11 OR AMS-QQ-A-250/11  
OR AMS 4025 OR AMS 4027 OR ASTM B209  
REF DART SPEC M6061T6S
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.01 lbs

**RELEASED**  
2016-06-29

**APPROVED**

|            |          |                                                                                                                                                                                                                                                                                 |              |
|------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | RF       | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                        |              |
| DRAWN      | RF       |                                                                                                                                                                                                                                                                                 |              |
| CHECKED    | VS       | DRAWING NO.                                                                                                                                                                                                                                                                     | REV. A       |
| MFG. APPR. | JLM      | <b>D5445</b>                                                                                                                                                                                                                                                                    | SHEET 6 OF 6 |
| APPROVED   | HS       | TITLE                                                                                                                                                                                                                                                                           | SCALE        |
| DE APPR.   | DS       | <b>CROSS BEAM ASSEMBLY</b>                                                                                                                                                                                                                                                      | NTS          |
| DATE       | 16.05.24 | COPYRIGHT © 2016 BY DART AEROSPACE LTD<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS<br>NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT<br>WRITTEN PERMISSION FROM DART AEROSPACE LTD. |              |



## Jean-Luc Menard

---

**From:** David Shepherd  
**Sent:** Friday, July 01, 2016 4:19 PM  
**To:** Jean-Luc Menard; Denis Maranda; Linda Lacelle  
**Cc:** Harvey Siemens; Bill Beckett; Kim Johnston; Roberto Fuentes; Patrick Smith  
**Subject:** RE: R66 Basket Parts Required

JL,

Your questions are probably better answered by the Program Manager (Harvey), but my take is it would be acceptable to ship all parts together at the end of July/early August.

Since this project has been deemed "nice to have" by Sales & Mktg, a 4 week turnaround for these parts seems very reasonable to me.

Regards,  
David

---

**From:** Jean-Luc Menard  
**Sent:** June-29-16 7:28 AM  
**To:** David Shepherd <dshepherd@dartaero.com>; Denis Maranda <dmaranda@dartaero.com>; Linda Lacelle <llacelle@dartaero.com>  
**Cc:** Harvey Siemens <hsiemens@dartaero.com>; Bill Beckett <bbeckett@dartaero.com>; Kim Johnston <kjohnston@dartaero.com>; Roberto Fuentes <rfuentes@dartaero.com>; Patrick Smith <psmith@dartaero.com>  
**Subject:** RE: R66 Basket Parts Required

Hi David,

We will start programing the parts Monday, beams will be cut next week.

As mentioned in last weeks e-mail(attached), we should have some results for the d5445 bent beams mid next week, at that point Roberto can decide if what we end up with is acceptable or not.

Due to vacation times and the flood of work this week, I would say 1<sup>st</sup> of August the parts will be in Calgary.

Some parts will be ready prior to that week, did you guys want everything at the same time or did you want us to ship whatever is ready as we manufacture them?

Let me know,  
JL

---

**From:** David Shepherd  
**Sent:** Monday, June 27, 2016 12:33 PM  
**To:** Denis Maranda <dmaranda@dartaero.com>; Linda Lacelle <llacelle@dartaero.com>; Jean-Luc Menard <jmenard@dartaero.com>  
**Cc:** Harvey Siemens <hsiemens@dartaero.com>; Bill Beckett <bbeckett@dartaero.com>; Kim Johnston <kjohnston@dartaero.com>; Roberto Fuentes <rfuentes@dartaero.com>; Patrick Smith <psmith@dartaero.com>  
**Subject:** R66 Basket Parts Required

All,

While Harvey was on holiday, I worked with Roberto to try to move the R66 basket project forward.

The following drawings have recently been approved in the Vault and are on their way to Hawkesbury with ECN 16-579 for processing :

- 1) D5350 Rev B (R66 Beam Assy)
- 2) D5354 Rev B (R66 Fwd Clamp Assy)
- 3) D5355 Rev B (R66 Aft Clamp Assy)
- 4) D5445 Rev A (Cross Beam Assy)

To re-do the structural test, Roberto would like the following parts in Calgary:

| Qty | Part Number | Notes                                                                       |
|-----|-------------|-----------------------------------------------------------------------------|
| 1   | D5445-041   | Powder Coat not required, D5445-043 End Caps not required                   |
| 1   | D5445-042   | Powder Coat not required, D5445-043 End Caps not required                   |
| 1   | D5350-1     | Powder Coat not required, Drill 0.375 holes to 0.257, OK to cut on waterjet |
| 1   | D5350-3     | Powder Coat not required, Drill 0.375 holes to 0.257, OK to cut on waterjet |
| 1   | D5354-1     | Anodize not required                                                        |
| 1   | D5354-2     | Anodize not required                                                        |
| 2   | D5355-1     | Anodize not required                                                        |

Please provide us with a date as to when we can have these parts in Calgary so that we can resume our testing.

We will need to receive the parts with a signed Conformity Inspection Record.

We will send the draft Conformity Inspection Record closer to the parts being ready for shipping.

David (Roberto's scribe)

Wednesday, June 08, 2016 9:02:05 AM

All amounts are calculated in domestic currency.

All Item ID/GL/WOs    All Rec. Employees    All Currencies

Grouped by Vendor ID

| Purchase Order ID/<br>Curr Type | Line Nbr/<br>Insp Req | Project ID       | Reference/<br>Description/<br>Cert Std | PO U/M /<br>Stock U/M | Required Date<br>Required Qty | Recv Date/<br>Recv Emp | Recv Qty<br>(PO U/M) | Cost Per Unit/<br>Recv Value | Inspected Qty/<br>Rejected Qty<br>(PO U/M) | MRB Qty/<br>MRB Reject Qty            | Book Amt |
|---------------------------------|-----------------------|------------------|----------------------------------------|-----------------------|-------------------------------|------------------------|----------------------|------------------------------|--------------------------------------------|---------------------------------------|----------|
| <b>VendorID\Vendor Name</b>     |                       | <b>VU-MCM001</b> | <b>McMaster-Carr Supply Co,</b>        |                       |                               |                        |                      |                              |                                            |                                       |          |
| PO32456                         | I                     |                  | 71900-90                               | Each                  | 6/1/2016                      | 6/6/2016               | 4.0000               |                              | 0.0000                                     | 0                                     | \$0.00   |
| USD                             | No                    |                  | 6546K999 6061-T6                       |                       | 4.0000                        | PLOU01                 |                      |                              | 0.0000                                     | 0                                     |          |
|                                 |                       |                  | ALUM                                   |                       |                               |                        |                      |                              |                                            |                                       |          |
|                                 |                       |                  | RECTANGLE TUBE                         |                       |                               |                        |                      |                              |                                            |                                       |          |
|                                 |                       |                  | 1/8" X 1" X 1-1/2"                     |                       |                               |                        |                      |                              |                                            |                                       |          |
|                                 |                       |                  | m134971                                |                       |                               |                        |                      |                              |                                            |                                       |          |
|                                 |                       |                  |                                        |                       |                               |                        |                      |                              |                                            | <b>Total Received Quantity:</b>       | 4.0000   |
|                                 |                       |                  |                                        |                       |                               |                        |                      |                              |                                            | <b>Total Qty to Inspect (PO U/M):</b> | 0.0000   |
|                                 |                       |                  |                                        |                       |                               |                        |                      |                              |                                            | <b>Total Reject Quantity:</b>         | 0.0000   |
|                                 |                       |                  |                                        |                       |                               |                        |                      |                              |                                            | <b>Total Receipt Value:</b>           |          |
|                                 |                       |                  |                                        |                       |                               |                        |                      |                              |                                            | <b>Total Balance Due Quantity:</b>    | 0.0000   |





# Packing List

200 Aurora Industrial Pkwy  
Aurora OH 44202-8087  
330-995-5500  
cle.sales@mcmaster.com

Dart Aerospace Ltd  
1270 Aberdeen St  
Hawkesbury ON K6A 1K7  
Canada  
Attention: Chantal Lavoie

Purchase Order  
**PO32456**

Order Placed By  
**Chantal Lavoie**

McMaster-Carr Number  
**3738720-01**

Page 1 of 1

06/03/2016

| Line | Product                                                                                                                                 | Ordered   | Shipped |
|------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------|---------|
| 1    | 6546K999 Extruded 6061-T6 Aluminum Rectangular Tubing, , 1" X 1-1/2", 1/8" Wall Thickness, 6' Length, , ** with Material Certificate ** | 4<br>Each | 4 ✓     |

*SO/6-6-8*



Sapa Industrial Extrusions  
1350 KIRBY LANE

SPANISH FORK, UT  
84660-1349

Sapa Extrusions Inc., a Subsidiary of Sapa AB

Invoice To Customer

RYERSON PROCUREMENT CORP  
PO BOX 91601

LUBBOCK, TX - 79490

Ship To Customer

RYERSON PROCUREMENT CORP  
2580 TECHNOLOGY DR

ELGIN, IL - 60123

## Certified Inspection Report

|                    |          |              |                    |                 |
|--------------------|----------|--------------|--------------------|-----------------|
| Sales Order Number | Line No. | Customer P/O | Cert Number        | Page            |
| 1101063550         | 2        | 4500746888-2 | SAPA2449369        | 1 of 2          |
|                    |          |              | Cert Creation Date | Cert Print Date |
|                    |          |              | 29-MAY-16          | 29-MAY-16       |

|                   |              |                                                                                                                                                    |                                                             |
|-------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Quantity Shipped  | Date Shipped | Item Description                                                                                                                                   | Specification                                               |
| 1074 LB           | 29-MAY-16    | Extruded Hollow Rect. Tube<br>1.000 H x 1.500 W x 0.125 WALL<br>72.5 IN LN<br>FIN M-MILL<br>W/F .661 F 14 CS 1.8<br>6061/T6<br>Marking CONTINUOUS; | ASTMB221 REV 14<br>ASMESB221 REV 09<br>AMS-QQ-A-200/8 REV A |
| B/L               | Item No.     |                                                                                                                                                    |                                                             |
| 742803            | G03993837    |                                                                                                                                                    |                                                             |
| Delivery Id       | Item No. Rev |                                                                                                                                                    |                                                             |
| 4790684           | ---          |                                                                                                                                                    |                                                             |
| Customer Part No. |              |                                                                                                                                                    |                                                             |
| 300038850         |              |                                                                                                                                                    |                                                             |

Applicable Specifications, Revisions and Exceptions

TAG: MCMASTER

COMPOSITION NOTE: The values for 'Others Each' and 'Others Total' have met the limits as shown on this certified inspection report. Remainder is Aluminum.

Legal Statement

We hereby certify that, unless otherwise indicated, the material covered by this report has been manufactured, inspected, and tested in accordance with, and has been found to meet, the applicable requirements described herein, including any specifications forming a part of the description and that samples representative of the material met the composition and had the mechanical properties shown on the face of this certification. Also, note that mercury is not a normal contaminant in aluminum alloys and neither it nor any of its compounds are used in the manufacture of our product. This certification is not to be reproduced in partial form without prior written approval of our Quality Assurance Dept.

Signature And Title

Justin Donald  
Quality Control Manager

29-MAY-16

Quantities per Lot / Packages

| Package Number | Lot Number | Quantity | UOM | Weight |     |
|----------------|------------|----------|-----|--------|-----|
|                |            |          |     | Gross  | Net |
| G14-PKG1802861 | 22480616   | 132      | PCS | 548    | 537 |
| G14-PKG1802862 | 22480616   | 132      | PCS | 548    | 537 |

Composition Limits

| Alloy | Si   |      | Fe  |      | Cu   |      | Mn  |      | Mg   |      | Cr   |      | Zn  |      |
|-------|------|------|-----|------|------|------|-----|------|------|------|------|------|-----|------|
|       | Min  | Max  | Min | Max  | Min  | Max  | Min | Max  | Min  | Max  | Min  | Max  | Min | Max  |
| 6061  | 0.40 | 0.80 | --- | 0.70 | 0.15 | 0.40 | --- | 0.15 | 0.80 | 1.20 | 0.04 | 0.35 | --- | 0.25 |



Sapa Industrial Extrusions  
1550 KIRBY LANE  
--  
SPANISH FORK, UT  
84660-1349

## Certified Inspection Report

Sales Order Number  
1101063550

Line No.  
2

Customer PO  
4500746888-2

Cert Number

SAPA2449369

Page

Page 2 of 2

Cert Creation Date

29-MAY-16

Cert Print Date

29-MAY-16

| Alloy | Ti  |      | Others Each |      | Others Total |      |
|-------|-----|------|-------------|------|--------------|------|
|       | Min | Max  | Min         | Max  | Min          | Max  |
| 6061  | --- | 0.15 | ---         | 0.05 | ---          | 0.15 |

### Composition Results

| Heat / Cast | Si   | Fe   | Cu   | Mn   | Mg   | Cr   | Zn   | Ti   | Others Each | Others Total |
|-------------|------|------|------|------|------|------|------|------|-------------|--------------|
| S16051608   | 0.74 | 0.35 | 0.23 | 0.06 | 0.85 | 0.05 | 0.06 | 0.02 | --          | --           |

### Mechanical Property - Test Limits

| Test Type   |            |            | UTS - L   |           | TYS - L   |           | EL 4D-Long |           |
|-------------|------------|------------|-----------|-----------|-----------|-----------|------------|-----------|
| UOM         |            |            | KSI       |           | KSI       |           | PCT        |           |
| # of Test   |            |            | --        |           | --        |           | --         |           |
| Test Temper | Lot Number | # of Tests | MIN Value | MAX Value | MIN Value | MAX Value | MIN Value  | MAX Value |
| T6          | 22480616   | 2          | 45.0      | 45.2      | 41.1      | 41.9      | 10.0       | 12.0      |

### Cert Notes

Material manufactured to T6S11 specifications also meets T6 requirements.

All elements are represented in the chemical analysis section. The remainder is Aluminum.

All mill finish alloys produced at Sapa Industrial Extrusions comply with Directive 2011/65/EU (RoHS 2) with the exception of 6262 alloy.

In accordance with EN 10204, Test Report Type 2.2 and Certificate Type 3.1

Material produced in compliance to EN 10204 3.1

Melted in USA or Qualifying Countries (as defined in Defense Federal Acquisition Regulation Supplement (DFARS) Section 225-872-1

Manufactured in USA

Manufactured in the United States



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO32456

Purchase Order Date 5/24/2016

PO Print Date 5/25/2016

Page Number 1 of 1

Order From :  
MCMASTER-CARR SUPPLY CO,  
P.O. BOX 7690  
CHICAGO, IL 60680-7690  
US

VU-MCM001

Ship To : DART AEROSPACE LTD  
1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

E-MAILED

MAY 25 2016

Contact Name  
Vendor Phone 330 995 5500  
  
Ship To Contact  
Ship To Phone  
Ship Via: Purolator ground ppd  
Ship Acct:

Buyer  
Customer POID  
Customer Tax # 10127-2607  
Terms Net 10  
Currency USD  
FOB FCA - (Free Carrier)

| Line Nbr | Reference<br>Vendor Part Number<br>Line Comments<br>Delivery Comments | Description/<br>Mfg ID                                        | Req Date/<br>Taxable<br>Promise Date | CD | Req Qty/<br>Unit of<br>Measure | PO Unit Price | Extended<br>Price |
|----------|-----------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------|----|--------------------------------|---------------|-------------------|
| 1        | 71900-90                                                              | 6546K999 6061-T6<br>ALUM RECTANGLE<br>TUBE 1/8" X 1" X 1-1/2" | 6/1/2016                             |    | 4.00                           | \$35.00       | \$140.00          |
|          | MATERIAL CERT REQUIRED                                                |                                                               | Yes<br>6/1/2016                      |    | Each                           |               |                   |

SP/6-6-8

Deliver To: CHANTAL

Line Total: \$140.00

PO Total: \$140.00

CY

Note: Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit [www.dartaerospace.com](http://www.dartaerospace.com) for further explanation.

Change Nbr: 2

Change Date: 5/25/2016